

## TECHNICAL SERVICES

### SPECIFICATION FOR THE PREPARATION OF OPERATION & MAINTENANCE MANUALS

**Issue 1.3  
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## **INTRODUCTION**

The Specification for the Preparation of Operation and Maintenance Manuals comprises 2 parts:

- Part 1            General Requirements
- Part 2            Particular Technical Requirements

wherein the minimum basic content of an Operation and Maintenance Manual (the “Manual”) is described.

The particular technical requirements specified in Part 2 are presented in the required format of the Manual. The requirements stated in italics are explanatory and shall not form part of the Manual whereas the requirements in standard typeface, including the numbers and names of each chapter and each section, in so far as they are applicable to the equipment which is the subject of the Manual, are obligatory.

# **PART 1**

## **GENERAL REQUIREMENTS**

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PART 1  
GENERAL REQUIREMENTS

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**1. CONTENT AND FORMAT**

**1.1 BASIC REQUIREMENTS**

- (a) All documentation shall be in English and descriptions shall be concise and complete. Any abbreviations used shall be in accordance with the contract documents.
- (b) The Manual shall comprise loose leaf A4 or A3 pages on presentation quality paper of at least 100 gsm and shall be submitted in presentation standard four ring binders. The binders shall be white and constructed from rigid and durable pvc covered heavyweight card with titles and the volume number applied in inlaid lettering on both the spine and front cover.
- (c) For first and final draft, 2 hard copies of the O & M Manuals shall be provided.
- (d) For Final version, 2 hard copies of the O & M Manuals together with one scanned copy in pdf.a format on CD-Rom shall be provided.

**1.2 MANUALS STRUCTURE**

- (a) Each manual shall be to a standard layout, sequence and numbering system. Drawings, tables and graphs shall be presented in a consistent, standard form. Where a chapter is not used, the chapter shall remain allocated and be annotated 'not applicable' in the contents lists.
- (b) The relevant information shall be included in the appropriate chapters of the Manual as shown in Part 2. This information can be further subdivided within the chapters in accordance with the complexity of the subject matter using additional headings or subheadings arranged in a logical order. Annexes and appendices to chapters can be provided to include supplementary details.
- (c) The maximum binder capacity for each volume of the hard copy of the Manual shall not exceed 70mm. Where a subject requires more than one volume, the contents of each volume shall be listed at the front of all volumes used, with the content of the volume being accessed also listed.

**1.3 FORMAT**

- (a) A4 pages shall be used for all text. Illustrations shall be on either A4 or A3 pages. A portrait layout is preferred (that is with the longest edge vertical) but some diagrams may be accepted in landscape form. All pages shall be uniquely identified and dated. See Fig 1.1 Page Layout for Manuals for margin dimensions and positioning of headers and footers. Headings shall have a logical hierarchy and be keyed to the numbering system to facilitate easy accessing of information from the contents list. The paper used shall be white, 100 gsm weight and suitable for use in an operational environment.
- (b) All text shall be prepared in single column with justified left and right-hand margins. All pages shall be printed on one side only. The type style shall be Arial 10pt as standard. See Fig 1.1 for headings. Manual cover sheet shall use Arial 14pt and 16pt as standard as shown in Part 2.

**1.4 PRELIMINARY PAGES**

- (a) A manual cover sheet shall be provided for each Manual giving the latest Hong Kong International Airport's logo, contract number, the title, system abbreviation, system description, volume number, issue number, the date of issue, and the contractor name. If the Manual consists of more than one volume, the identity and number of the volume shall be shown on the manual cover sheet.
- (b) A fly sheet shall be provided to include the names, addresses, telephone numbers and facsimile numbers of the Contractor and all relevant sub-

contractors, vendors, designers and service or maintenance agents, and all documents with which the Manual should be read in conjunction.

- (c) A Revision Record page shall be provided for the Manual detailing the Change No, Issue Date and Date of Insertion, see example at Part 2.
- (d) Abbreviations and glossary of terms shall be provided.
- (e) A comprehensive list of contents shall be included giving paragraph and page numbers for all major headings.
- (f) A comprehensive list of all file names for the electronic version shall be included giving file name, volume, binder, chapter number.

## **1.5 PAGINATION**

- (a) The page numbering system shown at the footers of Part 2 and the templates in the attached CD-Rom shall be adopted for the Manual.
- (b) The issue date and status shall also be shown at the footers. See example at footers of Part 2.

## **1.6 ELECTRONIC FORMAT**

This section specifies the Electronic Format requirements of the Manual.

### **1.6.1 Importation of Source Text File**

Source text files shall be in pdf.a file format in accordance to the style sheets described in CD-Rom to this Part 1. The templates are provided in CD-ROM in the attachment to this specification.

### **1.6.2 Importation of Source Graphic File**

- (a) Graphic files shall be provided as CCITT Group IV TIFF compressed files, scanned at 300 dots-per-inch (dpi).
- (b) Where graphic are created electronically on a computer aided design (CAD) type system, they shall be provided as either Windows Metafiles (WMF) or Computer Graphic Metafiles (CGM) format when the graphics contain only black-and-white line art information.
- (c) Where colour photographs are present in the source documentation, they shall be provided as GIF files in 256 colours or JPG files at 300 dpi. They shall have the same naming convention as the graphic listed above.

### **1.6.3 Delivery Media**

Files and data shall be provided on the following media:

- (a) CD-ROM in pdf.a format

## **2. UNITS OF MEASUREMENT**

Recognised standards shall be used for the presentation of unit symbols. Some general rules for presenting unit symbols are given below:

- (a) use SI Units ;
- (b) when in doubt, spell out the name of the unit ;
- (c) do not use full stops after the unit symbol (eg A = ampere, mm = millimetre). Do not abbreviate litre;
- (d) do not pluralize unit symbols with an "s" ;
- (e) put a one chapter space between the unit quantity and the unit symbol ;
- (f) use the unit symbols given on gauges, indicators etc.;
- (g) when a range of values is associated with a unit, the unit symbol shall be repeated after each number eg 2.3 mm to 7.8 mm. When a value followed by a tolerance is expressed, both shall be in the same units; the unit needs only be placed after the complete expression. The complete expression shall be

presented as “12 plus or minus 1 mm” when used in text and “  $12 \pm 1$  mm” when used in tables or illustrations ; and

- (h) numbers from one to nine shall be normally expressed as words when used in text, except when used in a dimensional sense or for reference purposes. Numbers of 10 and over are normally expressed in Arabic numerals except where ambiguity might otherwise result (eg two hundred and fifty 7 mm filter packs)

### 3. ILLUSTRATIONS

Illustrations shall be used in the Manual whenever they will shorten, simplify or make the text easier to understand. They shall be located as close as possible to the relevant text. The use of colour shall be avoided if possible, illustrations shall be black line drawings without shading or tones. For electronically stored graphics requirements, refer to section 1.6 of Part 1.

#### 3.1 TYPES OF LINE DRAWINGS

The following types of line drawings shall be used:

- (a) isometric projection ( $30^\circ/30^\circ$ , ellipse  $35^\circ$ ). This shall be the 3-dimensional drawing method for detail, exploded views or larger installations ;
- (b) perspective views may be used ;
- (c) orthographic projections. These 2-dimensional illustrations shall be used each time. This kind of presentation adequately serves the purpose ;
- (d) diagrams/schematics. This type of presentation shall be used to explain the operation of a system or a circuit ; and
- (e) graphs. This type of representation shall be used to explain the relation between various parameters.

**Note:** Engineering drawings shall not be used as illustrations.

#### 3.2 LEADER LINE

Leader lines shall be used in accordance with the following guidelines:

- (a) they shall be as short as possible;
- (b) they shall stop before an item;
- (c) they shall be stopped with a dot when entering a part; and
- (d) they shall only have arrowheads in exceptional circumstances to promote clarity (eg in graphs)

#### 3.3 CENTRE LINES/PROJECTION LINES

Centre lines/projection lines shall be used in illustrations to indicate how detail parts and assemblies match. The projection line shall be routed through at least one hole, or to a prominent reference point of the detail part/assembly. The centre line represents the imaginary line through a centre of an item/assembly. If possible, projection lines/centre lines shall not be angled off. Annotations shall use capital letters and have a final size of 2 mm on the printed page, see Example in Fig 1.2.

#### 3.4 SECTIONS

If enlarged views, details and sections are required for clarity, they shall be located on the illustration in an alphabetical order. Preferably start in the corner of the illustration with View A, detail A or Section A-A (whichever applies), proceeding if possible in a clockwise direction as necessary. Section cut-lines and section arrows must conform to the perspective of the view,. For location of hidden details not visible on main views, use locating arrows.

#### 3.5 ILLUSTRATION AREA

Illustration area is shown in Fig 1.3



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**3.6 NUMBER IDENTIFICATION AND TITLE**

- (a) In order to establish their relationship to the text, illustrations shall be given figure numbers and titles. The figure number, followed by the title, shall be centred at the bottom of the page, outside the reproduction area using the Normal Style, refer to Appendix A. The figure number and the title shall be separated with two blanks. If an illustration requires several sheets, the note (Sheet .... of .... ) shall be added at the end of the title. Figure number, title and note shall not exceed two lines.
- (b) Should electrical or electronic components require identification by Circuit Reference Designators, the designators shall be included in a legend and/or within the associated text, but shall not be included within the illustration itself. In the case of orthographic illustrations (eg a printed-circuit board), item numbers applied within the boundary of the component or by leader lines, can be used.
- (c) In cases where visually similar components appear at a number of different locations within one figure, it is permissible to illustrate them only once. Their locations and Item Numbers may be indicated by multiple indexing or tabulation on the illustration.

**4. TERMINOLOGY AND WRITING STYLE**

- (a) To ensure consistency in the Manual, standard nomenclature shall be used throughout. All such nomenclature and terminology shall be defined and included in the Glossary of Terms. Normally engineering drawings are the source data for nomenclatures, the drawings being used as verified source data to produce the Parts Listings.
- (b) Writing shall be in simple English to assist understanding by readers who may not be completely familiar with the language. Sentences shall be short. Diagrams and illustrations shall be used, whenever possible, to clarify the meaning. There shall be no unnecessary explanations or descriptions of obvious points. Clarity and conciseness shall be maintained in all texts.

**5. ISSUE AND REVISION PROCEDURES**

A revision to a page is defined as any authorised change to the printed matter that existed previously. Revisions, additions and deletions shall be identified by a vertical black line along the left-hand margin of the page opposite the portion of the printed matter that has been changed.

**6. COPYRIGHT**

All document provided in the manual shall comply with the Copyright Ordinance.

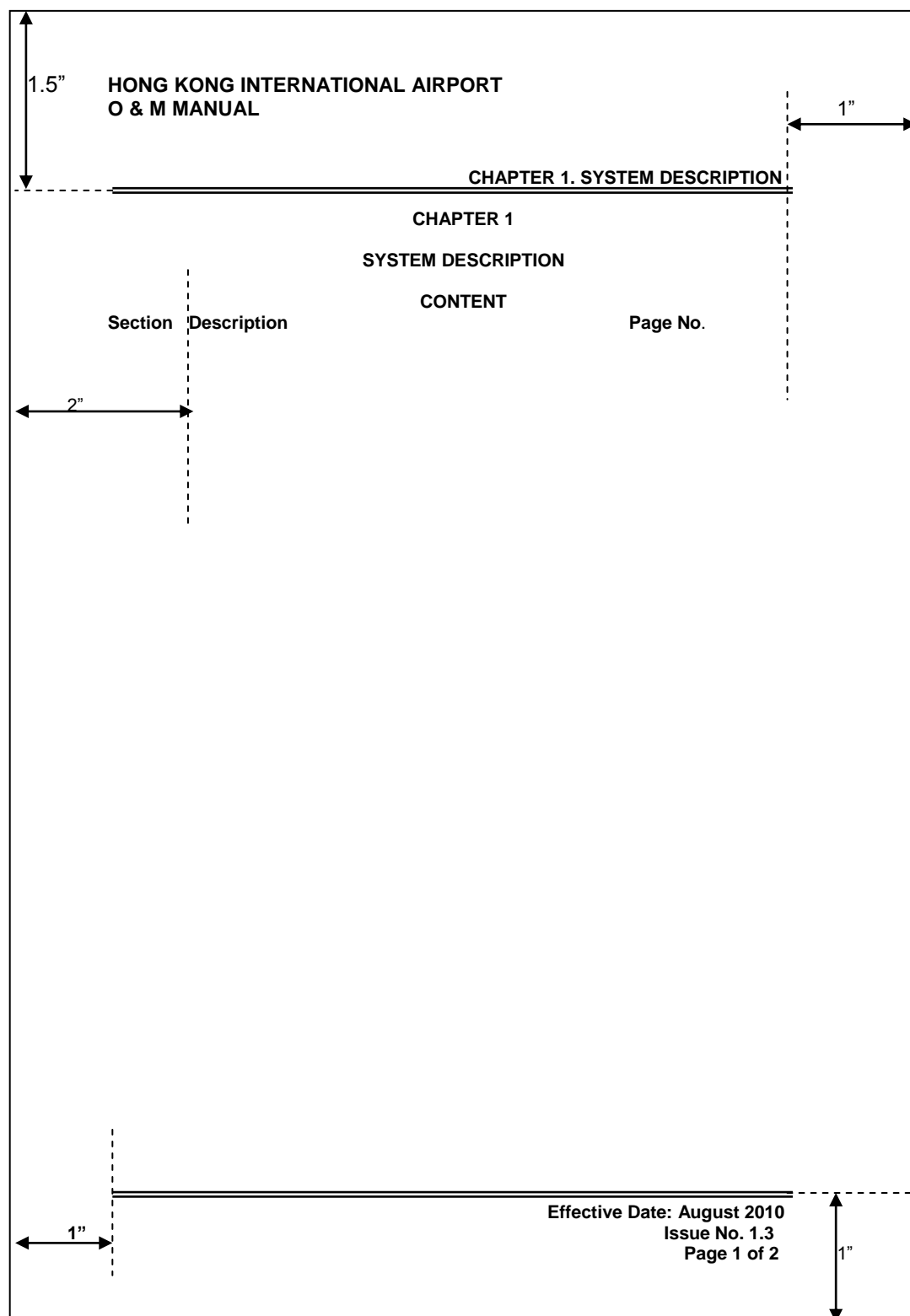


FIG 1.1 PAGE LAYOUT FOR MANUALS

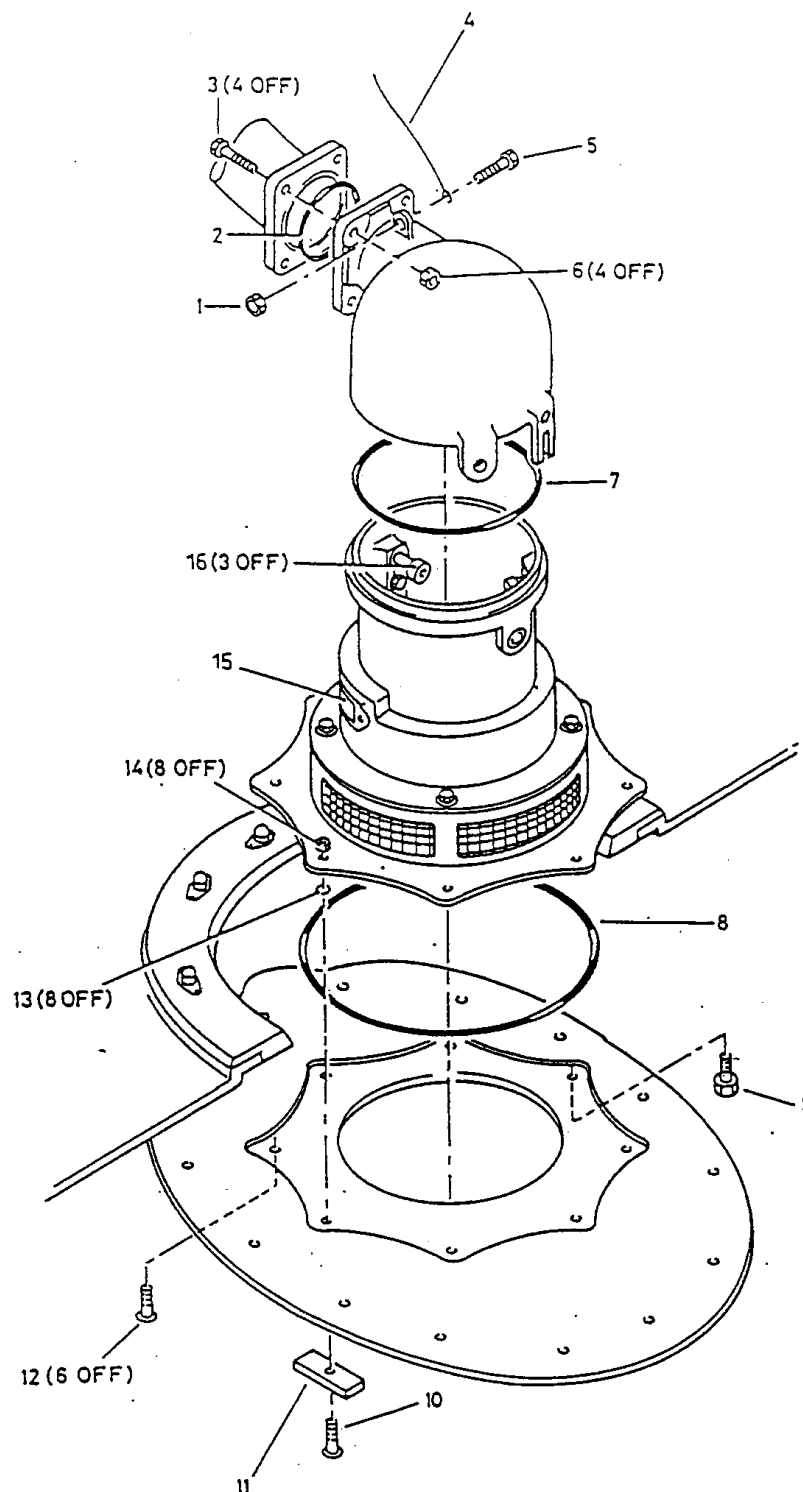


FIG 1.2 ILLUSTRATION STANDARD - EXAMPLE

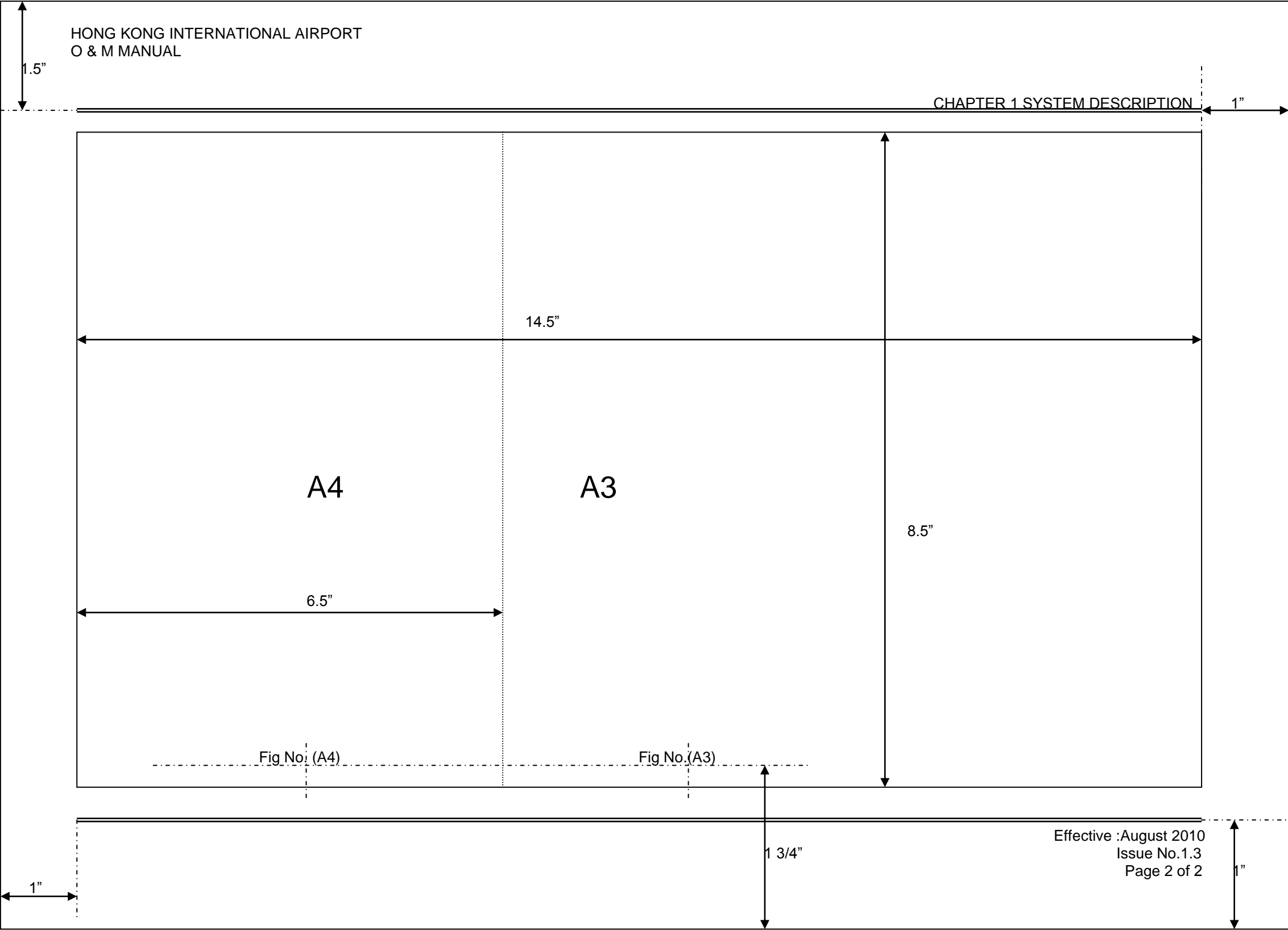


FIG 1.3 ILLUSTRATION AREAS

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**APPENDIX A**  
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**APPENDIX A**  
**STYLE SHEET**

**1. PAGE SET-UP**

<b>Page Set-up</b>		
<b>Page</b>	<b>Attribute</b>	<b>Set-up</b>
Page size	for text	A4
	for illustration	A4 or A3
Orientation	for text	Portrait (longest edge vertical)
	for illustration	Portrait or Landscape
Margins	From side	Top 1.5 in
		Bottom 1 in
		Left 1 in
		Right 1 in
	From edge	Header 0.5 in
		Footer 0.5 in
Tabs	Default tab stop	Every 0.5 in

**2. STYLES DEFINED IN MS WORD**

The following styles shall be used in electronic formatting of the O&M manuals.

<b>Style Format</b>		
<b>Style Name</b>	<b>Description</b>	<b>Applied to</b>
Normal	Font: Arial+10pt Language: English (UK) Alignment: Justified Spacing: Single	Extra blank line Different level numbered paragraph Different level paragraph Table
Chapter Text	Font: Normal+Bold, All Caps Alignment: Centred Spacing: 6 pt after Next style: Normal	Chapter and Chapter Title
Heading 1	Font: Normal+ Bold, All Caps Hanging indent: 1 in Spacing: 6 pt before, 3 pt after Next style: Normal	Heading 1
Heading 2	Font: Normal, All Caps Hanging indent: 1 in Spacing: 6 pt before, 3 pt after Next style: Normal	Heading 2

<b>Style Format</b>		
<b>Style Name</b>	<b>Description</b>	<b>Applied to</b>
Heading 3	Font: Normal+ Bold Hanging indent: 1 in Spacing: 3 pt before, 3 pt after Next style: Normal	Heading 3
Heading 4	Font: Normal Hanging indent : 1 in Spacing: 3 pt before, 3 pt after Next style: Normal	Heading 4
Header Title	Font: Normal+10 pt+All Caps+Bold Alignment: Left Spacing: 6 pt after	Manual title in headers
Header Chapter	Font: Normal+10 pt+All Caps Alignment: Right Border: ¾ pt double line bottom	Chapter title in headers
Footer	Font: Normal+10 pt+Bold Alignment: Right Border: ¾ pt double line top	Text in footers
Figure Caption (Use Normal)	Font: Normal+Bord, All Caps Alignment Centred	Caption for figure, Use Normal and Centre the figure caption
TOC Title	Font: Normal+Bold, All Caps Alignment: Centred Spacing: 6 pt before, 6 pt after Next style: TOC Heading	Table of Contents Title (Contents)
TOC Heading	Font: Normal+Bold Tabs: left 1 in, right 6.2 in Spacing: 6 pt before, 6 pt after Next style: TOC Text	Table of Contents heading
TOC Text	Font: Normal Tabs: left 1 in, right leading dots 6.2 in Spacing 6 pt after Next style: Normal	Table of Contents text for Chapter 1 – 8 TOC

Style Format		
Style Name	Description	Applied to
TOC 1	Font: Normal+ Bold, All Caps Alignment: Flush left, Right flush.... Tab stops: 1", 6.27" Spacing: 3 pt before, 3 pt after	<b>Table of Contents generated with MS WORD Insert + Index and Tables function using Custom Style.</b> Refer to section 3.1 following.
TOC 2	Font: Normal+All Caps Alignment: Flush left, Right flush... Tab stops: 1.49", 6.27" Spacing: 3 pt after	<b>Table of Contents generated with MS WORD Insert + Index and Tables function using Custom Style.</b> Refer to section 3.1 following
TOC 3	Font: Normal+Bold Alignment: Flush left, Right Flush.... Tab stops: 1.66", 6.27" Spacing: 3 pt after	<b>Table of Contents generated with MS WORD Insert + Index and Tables function using Custom Style.</b> Refer to section 3.1 following.
TOC 4	Font: Normal Alignment: Flush left, Right flush.... Tab stops: 1.91", 6.27" Spacing: 3 pt after	<b>Table of Contents generated with MS WORD Insert + Index and Tables function using Custom Style.</b> Refer to section 3.1 following.

### 3. NUMBERING

The numbering system specified hereafter shall not apply to appendices and annexes to the chapters. Numbering systems of appendices and annexes to chapters shall refer to examples in Part 2.

#### 3.1 TITLE, SUBTITLE AND TABLE OF CONTENTS

- (a) Each title or subtitle shall be numbered or identified using the following formats and the total levels of titles and subtitles shall not exceed four levels:
  - (i) Heading 1 1., 2., 3., ....etc
  - (ii) Heading 2 1.1, 1.2, 1.3, ....etc
  - (iii) Heading 3 1.1.1, 1.1.2, 1.1.3, ....etc
  - (iv) Heading 4 1.1.1.1, 1.1.1.2, 1.1.1.3, ....etc
- (b) These styles shall be found in the man\_chap.dot template. These styles shall **automatically** number sections. Table of Contents shall be generated using the MS WORD Insert + Index and Tables function. The Custom Style TOC shall be used. Custom Style settings shall be:
  - (i) 3 Show Page Number
  - (ii) 3 Right Align Page Numbers
  - (iii) Show Levels 3 or 4
  - (iv) TOC 1 – TOC 4 styles shall be used. TOC shall normally have no more than 3 levels. Complex chapters or sections may have 4 levels if it is considered appropriate by the author(s).



**3.1.1 List of Template & Excel Spreadsheets**

Following are the templates and spreadsheets on the CD-Rom. All styles referred to in the Specification are in the templates. Samples of all dot files and spreadsheets are in Section 4.2 of this appendix.

<b>List of Templates and Spreadsheets on Diskette</b>	
<b>Template/Spreadsheets</b>	<b>Explanation</b>
FAULTFIN.dot	Chapter 3 MAINTENANCE - Table
MAINTENS.dot	Chapter 3 MAINTENANCE – Table
MAN_CHAP.dot	All Chapters – TOC and main body of text
OPERATION.dot	Chapter 2 OPERATION – Table
PRELIMPG.dot	Cover sheets, fly sheets, revision pages, electronic file names
FDS_ASS.xlt	Chapter 1 SYSTEM DESCRIPTION – Spreadsheet
FDS_PRT.xlt	Chapter 4 SPARE PARTS – Spare Parts Lists

**3.1.2 Templates & Filenames**

The templates have been modified to print the filename on each page in the lower left footer.

**3.2 PARAGRAPH**

- (a) Paragraphs shall be numbered or identified using the following formats under each title or subtitle:
- (i) first level paragraph (a), (b), (c), ...(aa), (ab),....etc.
  - (ii) second level paragraph (i), (ii), (iii), ...etc.
  - (iii) third level paragraph • or – etc.
- (b) No number or identifier needs to be used when there is only one paragraph under a title or subtitle or paragraph.

**3.3 PAGE**

- (a) Pagination within each chapter shall commence at 1 and shall not continue into the next chapter.
- (b) Individual chapters spanning more than one volume, should be avoided. If unavoidable, pagination should be continuous within the same chapter.

**4. WORD TABLES & EXCEL SPREADSHEETS**

- (a) The following Word table or Excel spreadsheet templates shall be used for the Operating Procedure, the Maintenance Schedule, the Fault Finding Guide tables and the Asset Schedules and Spare Parts Lists.

<b>Table Templates</b>		
<b>Number</b>	<b>Name</b>	<b>Word Template/Excel Template</b>
1	Operating Procedure	OPERATIN.dot
2	Maintenance Schedule	MAINTENS.dot
3	Fault Finding Guide	FAULTFIN.dot
4	Parts List	FDS_PRT.xlt
5	Asset Schedule	FDS_ASS.xlt

- (b) Tables not listed above shall follow the general format. Tables shall be created using the Table tools provided in Word. The general format of a table shall contain a title row which are merged cells of the first row in the table. Followed are heading row and individual row for each item. Both the title and heading rows shall be repeated if the table spans more than one page.
- (c) The title row shall be bounded by top and bottom single line border of 1½ pt. The heading row shall be bounded by a 1½ pt top single line border and a ¾ pt bottom single line border. The last row of the table shall be bounded by a 1½ pt bottom single line border.

**4.1 EXAMPLE OF GENERAL FORMAT TABLE**

<b>Table Example</b>		
<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>
Item 1	Corresponding information related to Item 1	Corresponding information related to Item 1
Item 2	Corresponding information related to Item 2	Corresponding information related to Item 2
Item 3	Corresponding information related to Item 3	Corresponding information related to Item 3
Item 4	Corresponding information related to Item 4	Corresponding information related to Item 4

**4.2 SAMPLES OF ALL TEMPLATES**

- (a) Following are printouts of all sample templates supplied in the zip file except PRELIMPG.dot.

<b>List of Following Sample Templates/Spreadsheet</b>		
<b>Template/Spreadsheet</b>	<b>Explanation</b>	<b>Sample</b>
FAULTFIN.dot	Chapter 3 MAINTENANCE – Table	SAM_FF.doc
MAINTENS.dot	Chapter 3 MAINTENANCE – Table	SAM_MAIN.doc
MAN_CHAP.dot	All Chapters – TOC and main body of text	SAMPLE.doc
OPERATION.dot	Chapter 2 OPERATION – Table	SAM_OPS.doc
PRELIMPG.dot	Cover sheets, Revision Record, Contact Information, Bibliography, Abbreviation & Glossary, List of Electronic File Names and Contents page	NIL
FDS_ASS.xlt	Chapter 1 SYSTEM DESCRIPTION – Spreadsheet	SAM_ASS.xls
FDS_PRT.xlt	Chapter 4 SPARE PARTS - Spreadsheet	SAM_PRT.xls

- (b) The SAMPLE.doc OF MAN\_CHAP.dot template is a sample document of a chapter Table of Contents (TOC) and body of text using the defined styles. The TOC shall be generated using the MS WORD Insert + Index and Tables, Table of Contents function. The Custom Style format shall be used

## O & M MANUAL

**<SYSTEM ABBREVIATION> <SYSTEM DESCRIPTION>**

**<ENTER TITLE OF APPENDIX ALPHA >**

**<ENTER EQUIPMENT TAG FIN 1>**

[illegible]

Appendix Page 1 of 2

# HONG KONG INTERNATIONAL AIRPORT

## O & M MANUAL

<ENTER CONTRACT NUMBER> <ENTER CONTRACT TITLE>

<SYSTEM ABBREVIATION> <SYSTEM DESCRIPTION>

CHAPTER 3. MAINTENANCE : APPENDIX <ENTER APPENDIX NUMBER>

Fault: <enter a fault 1 >		
Symptom	Possible Cause	Action to Rectify
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ

<ENTER TITLE OF APPENDIX BETA >		
<ENTER EQUIPMENT NAME 2>		<ENTER EQUIPMENT TAG FIN 2>
Fault: <enter a fault 1 >		
Symptom	Possible Cause	Action to Rectify
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ
XXXXXXXXXXXXXXXXXXXXX	YYYYYYYYYYYYYYYYYYY	ZZZZZZZZZZZZZZZZZZZ

# HONG KONG INTERNATIONAL AIRPORT

## O & M MANUAL

<ENTER CONTRACT NUMBER> <ENTER CONTRACT TITLE>

<SYSTEM ABBREVIATION> <SYSTEM DESCRIPTION>

CHAPTER 3. MAINTENANCE : APPENDIX <ENTER APPENDIX NUMBER>

MONTHLY CHECKS

EQUIPMENT TAG : < 1 ENTER FACILITY IDENTIFICATION NUMBER>

EQUIPMENT SUPPLIER <ENTER SUPPLIER NAME>		LOCATION <ENTER LOCATION>	
EQUIPMENT	DATE DD/MM/YY	ISSUE	TOTAL PAGES
<NAME OF EQUIPMENT>		EQUIPMENT ENGINEERING SPECIFICATION	
EQUIPMENT REFERENCE DRAWINGS : <ENTER DRAWING REFERENCE>			

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**HONG KONG INTERNATIONAL AIRPORT**

**O & M MANUAL**

**<ENTER CONTRACT NUMBER> <ENTER CONTRACT TITLE>**

**<SYSTEM ABBREVIATION> < SYSTEM DESCRIPTION>**

**CHAPTER 3. MAINTENANCE : APPENDIX <ENTER APPENDIX NUMBER>**

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SAMPLE

## O & M MANUAL

**<SYSTEM ABBREVIATION> < SYSTEM DESCRIPTION>**

CHAPTER 3. MAINTENANCE : APPENDIX &lt;ENTER APPENDIX NUMBER&gt;

EQUIPMENT TAG : &lt; 3 ENTER FACILITY IDENTIFICATION NUMBER&gt;

EQUIPMENT SUPPLIER <b>&lt;ENTER SUPPLIER NAME&gt;</b>		LOCATION <b>&lt;ENTER LOCATION&gt;</b>	
EQUIPMENT   <b>&lt;NAME OF EQUIPMENT&gt;</b>	DATE DD/MM/YY	ISSUE	TOTAL PAGES
	EQUIPMENT ENGINEERING SPECIFICATION		
<b>EQUIPMENT REFERENCE DRAWINGS : &lt;ENTER DRAWING REFERENCE&gt;</b>			

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[CHAPTER TITLE]

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3.	LEVEL 1 HEADING A (STYLE HEADING 1)(TOC 1).....	3
3.1	LEVEL 2 HEADING A (STYLE HEADING 2)(TOC 2) .....	3

## CHAPTER 1

### SYSTEM DESCRIPTION

#### 1. LEVEL 1 HEADING A (STYLE - HEADING 1)(TOC 1)

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#### 2. LEVEL 1 HEADING B (STYLE - HEADING 1)(TOC 1)

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##### 2.1.2 Level 3 Heading B (Style Heading 3)(TOC 3)

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2.1.2.1 Level 4 Heading A (Style Heading 4)(TOC 4)

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2.1.2.2 Level 4 Heading B (Style Heading 4)(TOC 4)

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- (d) Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.

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# HONG KONG INTERNATIONAL AIRPORT

## O & M MANUAL

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<SYSTEM ABBREVIATION> <SYSTEM DESCRIPTION>

CHAPTER 2. OPERATION : APPENDIX <REPLACE WITH NUMBER>

### <TITLE OF APPENDIX ALPHA>

EQUIPMENT: <enter Name of equipment 1>

FIN <enter Facility Identification Number>

Step	Action	Notes
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
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Effective Date : <mm yyyy>

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### CHAPTER 2. OPERATION : APPENDIX <REPLACE WITH NUMBER>

EQUIPMENT:		<enter Name of equipment 1>
FIN		<enter Facility Identification Number>
Step	Action	Notes
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY

### <TITLE OF APPENDIX BETA>

EQUIPMENT:		<enter Name of equipment 2>
FIN		<enter Facility Identification Number>
Step	Action	Notes
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY
#	XX	YY YY YY

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EQUIPMENT: &lt;enter Name of equipment 2&gt;

FIN <enter Facility Identification Number>

Step	Action	Notes
#	xx	yy yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy
#	xx	yy yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy
#	xx	yy yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy yyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyyy

SAMPLE

System Hierarchy				Location Heirarchy			
System (15 char)	Sub-System (15 char)	Component (15 char)	Sub-Component (15 char)	Building (15 char)	Level (15 char)	Zone (15 char)	Postal (15 char)
TRS	TRS-01	0	TRS-S	T1	5	T	0
TRS	TRS-01	0	Main-Conveyor	T1	5	T	0
TRS	TRS-01	Main-Conveyor	PLC	T1	5	T	0
TRS	TRS-01	Main-Conveyor	Belt	T1	5	T	0
TRS	TRS-01	Main-Conveyor	Motor	T1	5	T	0
TRS	TRS-01	Main-Conveyor	Pulley	T1	5	T	0
TRS	TRS-01	Gripper-Belt	Belt	T1	5	T	0

[illegible]



Facility Description (200 char)	Facility Location (100 char)	Facility Value	Installation Date (yyyy-mm-dd)	Manufacturer (40 char)	Supplier (40 char)	Installation Contract / Works Order Number (40 char)	Installation Contractor (40 char)
------------------------------------	---------------------------------	----------------	-----------------------------------	---------------------------	-----------------------	---	---

SAMPLE

								Asset Life		
Manufacturer's Model Number (30 char)	Manufacturer's Serial Number (32 char)	Type	Drawing Number (32 char)	Finance FAR Asset ID	Quantity (32 char)	Unit (10 char)	Specification Reference No. (100 char)	Warranty Period (10 char)	Warranty Expiry Date (yyyy-mm-dd)	Useful Life (10 char)

[illegible]

Physical Data (Dim Inclusive of Package Size)							Environmental Requirement						Electrical Requirement		Power Consumption			Equipment Reliability		PM Requirement					
No.	Height m	Depth m	Width m	Diameter mm	Weight kg	Quantity no. of items in pkg	Minimum Storage Temp. °C	Maximum Storage Temp. °C	Optimal Storage Temp. °C ±	Minimum Storage Humidity	Maximum Storage Humidity	Optimal Storage Humidity ±	Voltage V ±	Frequency Hz ±	Current Amp.	Power watt	Power Factor %	Average Down Time hours	Mean Time Between Failure hours	Warranty Period months	Warranty Expire Date	Inspection Certificate Number	Batch Number	Contract Number	Purchase Order Number
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ATTACHMENT**

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**PART 1  
ATTACHMENT**

**1. CD-ROM: SAMPLES AND TEMPLATES**

**PART 2**  
**PARTICULAR TECHNICAL REQUIREMENTS**



香港 | HONG KONG  
國際機場 | INTERNATIONAL  
AIRPORT

**OPERATION AND MAINTENANCE MANUAL**

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**[CONTRACT TITLE]**

**[SYSTEM ABBREVIATION]**

**[SYSTEM DESCRIPTION]**

**[VOLUME NUMBER X OF XX]**

**[ISSUE NUMBER]**

**[ISSUE DATE]**

**PREPARED BY [CONTRACTOR NAME]**





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&lt;SYSTEM ABBREVIATION&gt; &lt;SYSTEM DESCRIPTION&gt;

FLYSHEET

Contact Information	
Address	Detail
<Name> contact person Permanent Address Phone Fax	main contractor
<Name> contact person Permanent Address Phone Fax	sub-contractor
<Name> contact person Permanent Address Phone Fax	supplier
<Name> contact person Permanent Address Phone Fax	vendor
<Name> contact person Permanent Address Phone Fax	<list other relevant area>
Service or maintenance agents contact person Permanent Address Phone Fax	<list other relevant area>

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**FLYSHEET**

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**Bibliography**

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**Reference**

**Publisher**

**Title**

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fill in "Not applicable"

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**ABBREVIATIONS**

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**Abbreviations and Glossary**

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**Term**

**Description**

<Describe any specific  
term>

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Chapter 4	Spare Parts .....	
Chapter 5	Testing and Commissioning Data and Results .....	
Chapter 6	Statutory Requirements .....	
Chapter 7	Drawing List .....	
Chapter 8	Emergency Procedures .....	

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**ELECTRONIC FILE NAMES**

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**LIST OF ELECTRONIC FILE NAMES**

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<b>File Name</b>	<b>Volume Number</b>	<b>Binder Number</b>	<b>Chapter Number</b>
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**CHAPTER 1**

**SYSTEM DESCRIPTION**

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**CHAPTER 1****SYSTEM DESCRIPTION**

*This chapter shall include a description of each component of the system sufficient to provide an understanding of its function and the function of the system as a whole and its relationship with interfacing systems; where “system” means all plant, facilities, and equipment, of every kind including electrical, mechanical installations, computer hardware and software, all constituent parts, special tools and equipment, building elements to be covered in the Manual.*

**1. EQUIPMENT AND SYSTEM DESCRIPTIONS**

*This section shall contain the primary information on all items of the system, including design, any unique features, application, applicable codes and standards, physical data, capacity and operating data, materials of construction, etc, the detail of which shall be supported by the data provided in Chapter 5 – Testing and Commissioning Data and Results. The description shall be supported with diagrams to illustrate the narrative. Sketches which serve to enhance descriptions shall also be included.*

**2. INTERFACES WITH OTHER SYSTEMS**

*This section shall provide a description of all the interfaces between the system and the other systems. Information shall be provided in the narrative describing the cause and effect relationship with other systems.*

**3. SCHEDULE OF ASSETS**

*The equipment and system described above constitute the Airport Authority assets. The enclosed diskette contains a Microsoft Excel spreadsheet template to be used to list and describe these assets, FDS\_ASS.XLT. The Schedule shall be in an Appendix to this chapter. Refer to following Appendix for an example and instructions on how to prepare the Schedule.*

**4. INSTRUCTIONS FOR SCHEDULE OF ASSETS – FDS\_ASS.XLT****4.1 FIELD DEFINITIONS**

The fields shall be provided as completely and accurately as possible.

**4.2 FILE NAMING CONVENTIONS**

- (a) The Excel files shall be named following the pattern ACCCNN@.xls.
- (b) The A is fixed and stands for assets.
- (c) CCC equals the contract/subcontract number.
- (d) NN equals a sequential number 01-99.
- (e) @ equals a – z and shall be used when a contract has more than one set of O&M Manuals for the contract/subcontract number.
- (f) A table shall be provided listing all files.

**SAMPLE OF EXCEL FILE NAMES**

File Name	Contract Name	Detailed Description
A40101a.xls	401 Airfield Works	Design Contract 151 Tributary Stormwater Drainage and Oil Separation System
A40102a.xls	401 Airfield Works	Design Contract 151 Tributary Stormwater Drainage and Oil Separation System
A40103b.xls	401 Airfield Works	Design Contract 151 Airfield Pavements



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### CHAPTER 1. SYSTEM DESCRIPTION

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#### 4.3 SIZE OF FILES

The files shall not have more than 3000 rows of information.

#### 4.4 COLUMN WIDTH

Column width is defined and shall not be changed.

#### 4.5 HEIRARCHY AND LOCATION CODES

The hierarchy and location codes shall be completed as directed by the Authority.

#### 5. **SAMPLE APPENDIX SCHEDULE OF ASSETS**

Refer to Part 1, Section 4.2 SAMPLES OF ALL TEMPLATES.

**CHAPTER 2**

**OPERATION**

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5.	SAFETY PROCEDURES.....	4
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## CHAPTER 2

### OPERATION

*This chapter shall contain the complete operating and safety instructions for all anticipated normal and abnormal operating modes of the system.*

#### 1. GENERAL

*This section shall contain all advisory information helpful to the understanding of this chapter such as a list of abbreviations used, explanation of any symbols or codes and a list of cross-references applicable to the related Operating Procedures.*

#### 2. OPERATING DETAILS

*Operating Details shall include:*

- Instructions on how to operate, adjust, control, monitor and regulate it;
- a detailed description of control and operation sequences;
- pre-start checklists and task list;
- starting and stopping procedures;
- automatic, manual and emergency operating procedures;
- adjustment and regulation requirements;
- guidelines for seasonal changeover;
- inspection instructions and procedures, including inspection and testing schedules, frequencies and checklists, and recommendations on methods of logging and recording;
- methods of part-load operation;
- procedures for reducing energy consumption;
- methods of detecting and identifying malfunctions, including normal and abnormal operating criteria, detection signals and diagnostic analysis;
- precautionary measures to avoid misuse;
- trouble-shooting guidelines;
- system over-load limits and precautions;
- lists of alarms and its associated possible causes and required response action, corrective measures and reset procedures; and
- system and/or equipment normal operating set point/range and its max./min. operating limits.

### 3. TECHNICAL DESCRIPTION

*This section shall contain sufficient technical information to allow the user to operate each item of the system safely in accordance with the manufacturers recommendations and defined performance criteria.*

*Technical descriptions for plant equipment and systems shall include:*

- an explanation of its function;
- Facility Identification Number (FIN);
- identification its classification;
- details of the criteria governing its design or selection;
- a description of its performance characteristics;
- instructions on how to operate, adjust, control, monitor and regulate it;
- its size and capacity;
- the initial and final commissioned and approved setting of protective devices and other adjustable components;
- a detailed description of the electrical supply, distribution and control systems;
- detailed procedures governing the operation of electrical equipment;
- a list of its principal components;
- details of its location and support requirements;
- a detailed description of the control sequence and operation of the equipment;
- as-constructed reduced scale copies (to A3 size) of all controls and electrical schematics incorporating all type and size references and all settings;
- equipment data, including equipment schedules, the inventory designation, details of the manufacturer, model size and rating, and technical data such as pressure, speed and temperature limitations; and
- installation and operational tolerances.

**4. SOFTWARE PROGRAMMES**

*If the system includes software, the software programme shall be included in the annexes to this chapter and each software programme shall be provided in a dedicated volume of the Manual and shall include:*

- a printout of the listing;
- flow chart, data flow diagrams and programme description;
- instructions on the use of diagnostic software;
- a programming and system user manual; and the identity of application source software, special tools and utility software to enable the user to modify or develop the programme.

This section shall contain a list of the software programme names and descriptions with cross references to the annexes.

**5. SAFETY PROCEDURES**

*This section shall contain information related to all significant risks concerning the health and safety of installing, using, operating, maintaining and disposal of any item of the system over its whole life cycle. Details shall include the following safety procedures as a minimum:*

- The identification of all safety set point;
- precautionary measures to prevent exposure to electrical hazards;
- precautionary measures to prevent exposure to mechanical and physical hazards;
- precautionary measures to prevent exposure to fire and explosive hazards;
- precautionary measures to prevent accidents during chemical handling;
- first aid and accident reporting;
- details of any activity requiring special certified competency;
- information on any known dangers likely to arise during the disposal of specific items of plant and substances together with disposal instructions; and
- sources from which further advice may be obtained;
- Recommended measures for the handling, transportation & storage protection.

**6. OPERATING PROCEDURE**

This section shall contain the operating procedures in broad detail for each item of the system. Step-by-step operating procedures for each item of the system shall be provided in an appendix to this chapter titled 'Detailed Operating Procedures' with such details and in the format as shown in Figure 2.1.

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CHAPTER 2. OPERATION

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CHAPTER 2. OPERATION : APPENDIX A

[TITLE OF APPENDIX]

EQUIPMENT: OPERATION PROCEDURE AIR CONDITIONING –Arrival Hall OPS/62  
FIN

Step	Action	Notes
5.9	Place Power Switch (PS1) to CN.	Power Available Light on Control Panel (CP3) is illuminated.
5.10	Select Air Conditioning at A/C Selector (AC1).	
5.11	Set Temperature Control Selector (TC4) to desired temperature.	See Procedural Guide for Public Premises.
5.12	Select main Damper (MD1) to Open.	
5.13	Place Fan Switch (AC2) to MAX.	Air Flow Indicator on Control Panel is illuminated.
5.14	Monitor the temperature in the Hall at CP3 Gauge, when desired temperature is reached, put Fan Switch (AC2) to AUTO.	Selected temperature should be achieved within in 15 mins.
5.15	Enter time in Log.	Temperature readings must be recorded at hourly intervals.

Procedure completed for Arrivals Hall

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FIG 2.1 OPERATING PROCEDURE – PRESENTATIN EXAMPLE

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## CHAPTER 3

### MAINTENANCE

*This chapter shall contain all the details required for the safe maintenance of all items of the system prior to installation, during installation and operation, removal and disposal of the system*

#### 1. **PLANNED MAINTENANCE**

*Planned maintenance is maintenance carried out in accordance with a pre-determined plan and schedule. This section shall contain the planned maintenance plan and schedule to cover all items of the system.*

##### 1.1 MAINTENANCE SCHEDULE

*Planned maintenance schedule shall be time-based or hours-run-based. It shall be presented in a logical sequence with all tasks on any item of the system and in any particular area. For tasks that require several people, the responsibilities of each maintenance team member shall be described in the form of notes or instructions with cross reference to other parts of the Manual where applicable. The maintenance tasks shall be presented in the form of a maintenance tasks list as shown in Fig. 3.1 to describe the details of the maintenance tasks in a logical sequence. In general the tasks shall be grouped and divided into:*

- recommended periodic routine inspections (for example, daily, weekly, etc.);
- checks and tests;
- proving operations (normally on infrequently used items);
- maintenance tasks lists; and
- similar tasks or same geographical location.



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CHAPTER 3. MAINTENANCE : APPENDIX B

**MONTHLY CHECKS****EQUIPMENT TAG : (FIN)**

EQUIPMENT SUPPLIER		LOCATION	
HEYWOOD COMPRESSOR CORP. (REF 750)		TYPE SERVICE BAY	
EQUIPMENT	DATE	ISSUE	TOTAL PAGES
AIR COMPRESSOR - ENGINE	EQUIPMENT ENGINEERING SPECIFICATION		
EQUIPMENT REFERENCE DRAWINGS :			

**7. Engine Mounted Filter Installation**

7.1 Install a new filter element and a new seal as follows:

- (a) Close the fuel cock [12].
- (b) Place a suitable container under the fitter drain plug [2] to collect spilled Fuel.
- (c) Remove the drain plug [2] and washer [3].
- (d) Remove the nut [4], fibre washer [5], Fitter cover [6], spring [7], filter element [8] and seal [9] from the head [10]. Discard the filter element and seal.
- (e) Clean the filter cover [6] and all removed components and inspect all filter assembly components for damage. Rectify as necessary.
- (f) Assemble a new seal [9] in the filter head [10] and a new filter element [8] on the stud [11].
- (g) Place the spring [7] on the stud [11] and assemble the filter cover [6], fibre washer [5] and nut [4]. Tighten the nut.
- (h) Assemble the drain plug [2] and washer [3] to the filter cover [6]. Tighten the plug.

7.2 Clean the sump bowl [12] as follow:

- (a) Confirm that the fuel cock [1] is closed.

- (b) Loosen the knurled nut [14] and remove the sump bowl [12].

- (c) Empty and clean the sump bowl.

- (d) Examine the lift pump components for damage. Rectify as necessary.

- (e) Assemble the sump bowl [12] on the lift pump [13] and secure with the knurled nut [14].

7.3 Bleed the engine mounted filter and lift pump as follow:

- (a) Bleed the fuel supply filter and leave the fuel cock [1] open (refer to paragraph 6.2).

- (b) Remove the bleed screw [15] from the engine mounted filter.

- (c) Operate the hand priming lever [16] until air free fuel flows from the bleed screw hole. Install the bleed screw [15].

- (d) Repeat items (a), (b) and (c).

- (e) Confirm that the bleed screw [15] is tight.

- (f) Operate the hand priming lever and inspect the engine mounted filter and lift pump for leaks. Rectify as Necessary.

- (g) Confirm that the works area is clean and clear of tools and miscellaneous equipment.

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**FIG 3.1 MAINTENANCE TASK LIST-EXAMPLE**

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**2. CORRECTIVE MAINTENANCE**

*Corrective maintenance is maintenance carried out to restore an item of the system to its original specified standards or function after excessive wear, breakdown, damage, or failure of an item of the system has occurred or when a failure is anticipated. Corrective maintenance is reactive in response to the reported defects and deterioration found during normal operation and planned maintenance.*

*This section shall contain sufficient information to enable maintenance personnel to carry out all repair tasks including strip-down, assessment of wear tolerances, fitting replacement component parts and testing to restore the system to its original specified standards or function.*

**3. MAINTENANCE PROCEDURES**

*Corrective maintenance procedures shall contain specific tasks grouped or divided systematically and presented in the form of maintenance tasks list shown in Fig. 3.1.*

**4. TEST EQUIPMENT AND TOOLS**

*This section shall include a list of special tools, jigs, fixtures, gauges, test equipment (together with calibration certificates) and materials recommended by the manufacturer or required to carry out all the functions described in the maintenance task lists.*

**5. FAULT FINDING GUIDE**

*This section shall include a simple listing of Symptom, Possible Cause and recommended Action to Rectify or an algorithmic diagram for each system where applicable.*

**5.1 TABULAR FAULT FINDING GUIDE**

*Possible Causes of faults shall be listed in a logical order and brief details shall be given of the recommended Action to Rectify as shown in the example in Fig. 3.2 and shall be provided in an appendix to this chapter.*

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[TITLE OF APPENDIX]		
EQUIPMENT	EQUIPMENT TAG (FIN)	
FAULT: AHU Fails to Start		
Symptom	Possible Cause	Action to Rectify
Power Available lamp not illuminated	No Power Available	Check 220V supply is connected
Contractor (SC) not made	Starter Fault	Carry out Starter Check AHUS 13
Fan Motor running but no Air Flow	Control Settings Incorrect	Check Damper positions and Temperature Control setting
Motor will not run even when AHU controls correctly set	Motor Failure	Carry out Motor Windings and Connections checks

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FIG 3.2 FAULT FINDING GUIDE - TABULAR FORMAT EXAMPLE

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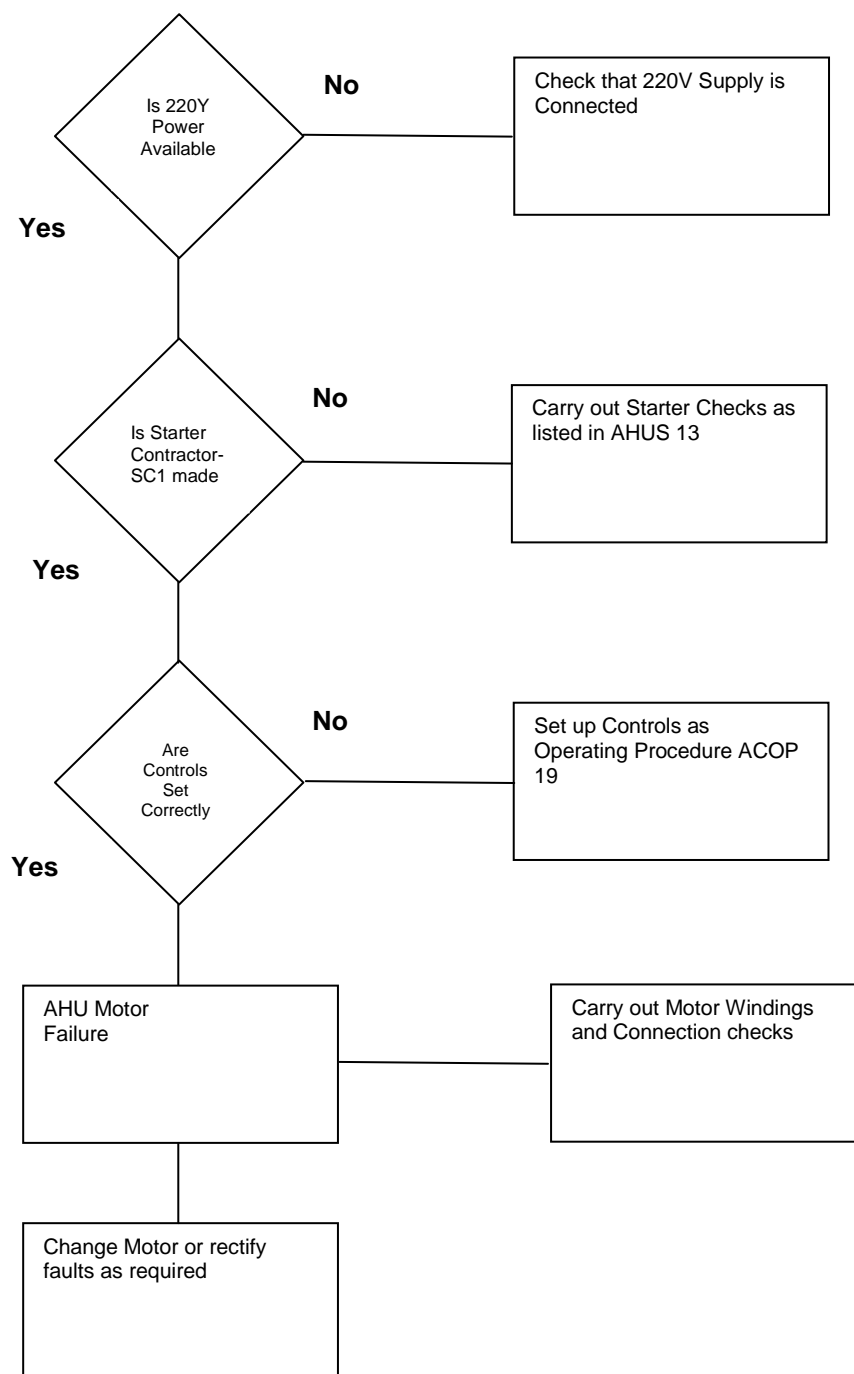
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## 5.2

## FAULT FINDING ALGORITHM

*Sequential flow, logical Decision boxes and cross-refer to recommended Actions to Rectify shall be used as shown in Fig. 3.3*

**AHU FAILS TO START****FIG 3.3 FAULT FINDING ALGORITHM EXAMPLE**

### 5.3 WARRANTIES AND GUARANTEES

*This section shall contain a copy of the warranties and Guarantees such as the following:*

- Materials and Workmanship Warranties which state that the specified plant, material, product or system is confirmed to have been provided in accordance with the Specifications and is warranted for the stipulated warranty period.

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**CHAPTER 4**  
**SPARE PARTS**

**CONTENTS**

<b>Section</b>	<b>Description</b>	<b>Page No.</b>
<b>1.</b>	<b>NAME OF SPARE PARTS LISTS.....</b>	<b>2</b>
<b>2.</b>	<b>INSTRUCTIONS FOR DETAILED SPARE PARTS LIST – FDS_PRT.XLT .....</b>	<b>2</b>
2.1	FIELD DEFINITIONS .....	2
2.2	FILE NAMING CONVENTIONS .....	2
2.3	SIZE OF FILES .....	2
2.4	COLUMN WIDTH .....	3
2.5	PRINTING .....	3
2.6	NUMBERING .....	3
<b>3.</b>	<b>SAMPLE SPARE PARTS APPENDIX .....</b>	<b>3</b>

## CHAPTER 4

## SPARE PARTS

*This chapter shall provide sufficient information including illustrations for maintenance personnel to identify and locate any assembly, sub-assembly or component part of the system.*

*Illustrations shall accompany with a spare parts list. An example of the illustration is shown in Fig 4.1 Exploded View. Each item of spare parts shall be given a Figure Reference and Item Number and the numbers shall be numbered consecutively. The Figure and item numbers shall be shown clearly to identify the parts in the spare parts list.*

## 1. NAME OF SPARE PARTS LISTS

- (a) This section shall contain the names of all the spare parts lists. The following general table format is provided as an example.

**Example : Names of Spare Parts Lists for Equipment/Item/System**

Name	Identifying or Model Number	Excel File
Carrier Air Handler	C9600-87DH	S32001a.xls
Carrier Compressor	DEH6500-44E	S32002a.xls

- (b) **Name** – the manufacturer's official title for the piece of equipment, item or system,. If there is none, give a short description. This Name shall be used in the Excel spreadsheet.
- (c) **Identifying or Model Number** – the manufacturer's identification code or model number.
- (d) **Excel File** – name of the appropriate Excel file. See below for how to name the Excel files.

## 2. INSTRUCTIONS FOR DETAILED SPARE PARTS LIST – FDS\_PRT.XLT

The details of the spare parts shall be provided as shown in Part 1, Section 4.2 SAMPLES OF ALL TEMPLATES. The Microsoft Excel spreadsheet FDS\_SPR.xlt shall be used as the template.

## 2.1 FIELD DEFINITIONS

The fields shall be provided as completely and accurately as possible.

## 2.2 FILE NAMING CONVENTIONS

- (a) The Excel files shall be named following the pattern [SCCCNN@.xls](#).
- (b) The S is fixed and stands for spares.
- (c) CCC equals the contract/subcontract number.
- (d) NN equals a sequential number 01-99.
- (e) @ equals a – z and shall be used as required to provide detail. For instance, to differentiate two lists for the same model of equipment.

## 2.3 SIZE OF FILES

The files shall not have more than 3000 rows of information.

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### CHAPTER 4. SPARE PARTS

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- 2.4 COLUMN WIDTH  
Column width is defined and shall not be changed.
- 2.5 PRINTING  
The files shall be printed across and then down. The spreadsheets are set to this print configuration.
- 2.6 NUMBERING  
The numbers in column A shall be completed using the Edit, Fill, Series function in Excel.
3. **SAMPLE SPARE PARTS APPENDIX**  
Refer to Part 1, Section 4.2 SAMPLES OF ALL TEMPLATES.



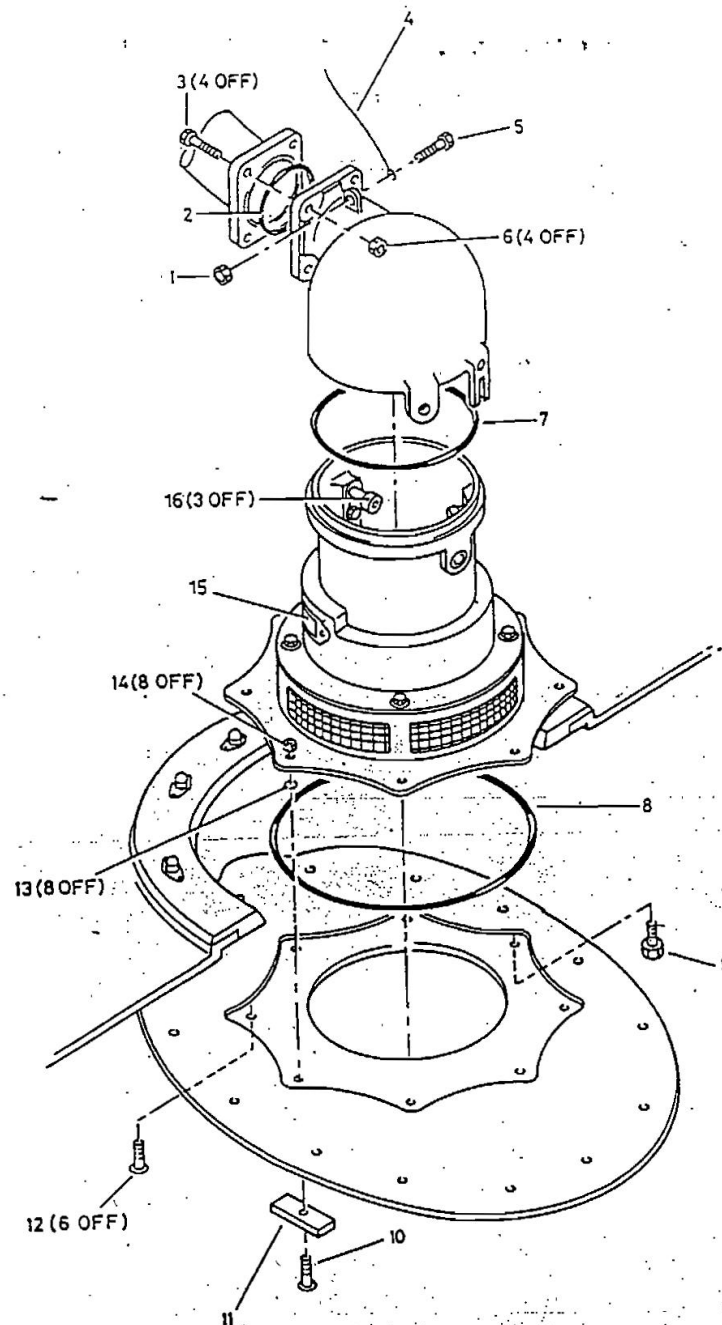


FIG. 4.1 EXPLODED VIEW

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CHAPTER 5. TESTING AND COMMISSIONING DATA AND RESULTS

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**CHAPTER 5**

**TESTING AND COMMISSIONING DATA AND RESULTS**

**CONTENTS**

<b>Section</b>	<b>Description</b>	<b>Page No.</b>
1.	DATA AND RESULTS.....	2

**CHAPTER 5**

**TEST AND COMMISSIONING DATA AND RESULTS**

**1. DATA AND RESULTS**

*This chapter shall include details of all commissioning and tests applicable to the system and the associated equipment. All signatories acting on behalf of the parties involved in the testing and commissioning process shall be clearly identified, with printed names and positions of responsibility annotated on the test certificates or commissioning data sheets.*

*Testing and Commissioning data shall be recorded on forms provided through relevant Codes of Practice or Regulations. When forms of this type are not available, a standard format consistent in style throughout the various disciplines and trades shall be used.*

*The following information where applicable shall be included:*

- test objective
- test procedure
- instrumentation and calibration
- design data
- measured data and tolerances
- ambient conditions
- witness and acceptance requirement
- test certificates
- a copy of each relevant guarantee or warranty

**CHAPTER 6**

**STATUTORY REQUIREMENTS**

**CONTENTS**

<b>Section</b>	<b>Description</b>	<b>Page No.</b>
<b>1.</b>	<b>GENERAL.....</b>	<b>2</b>
<b>2.</b>	<b>APPROVALS AND CERTIFICATES.....</b>	<b>2</b>

**CHAPTER 6**

**STATUTORY REQUIREMENTS**

*This chapter shall contain all statutory certificates, statutory authority written approvals and certificates required by insurer together with any other certification necessary for operating the system.*

**1. GENERAL**

*This section shall provide an overview of the statutory requirements and a list of approvals and certificates.*

**2. APPROVALS AND CERTIFICATES**

*This section shall contain a copy of the approvals and certificates such as the following:*

- Building Department approvals
- Fire Services Department approvals
- Acceptance certificates from Electrical Power, Water, Fuel and Gas Authorities
- Pressure vessel factory test certificates
- Labour Department approvals
- Other government department's approvals as required

**CHAPTER 7**  
**DRAWING LISTS**  
**CONTENTS**

<b>Section</b>	<b>Description</b>	<b>Page No.</b>
1.	DRAWING LIST .....	2

**CHAPTER 7**  
**DRAWING LISTS**

**1. DRAWING LIST**

*This section shall include a full list of the following drawings for the system:*

- As-built drawings;
- equipment suppliers' drawings (together with the suppliers names and addresses); and
- CAD files (together with the drawing list) in Intergraph format.

*All drawings shall be identified by number and title together with issue number and issue date.*

**CHAPTER 8**

**EMERGENCY PROCEDURES**

**CONTENTS**

<b>Section</b>	<b>Description</b>	<b>Page No.</b>
1.	EMERGENCY INFORMATION .....	2



**CHAPTER 8**

**EMERGENCY PROCEDURES**

**1. EMERGENCY INFORMATION**

*This chapter shall contain comprehensive emergency information associated with the operation and maintenance of the system. This chapter shall be provided in a separate volume(s) or ease of access. The information shall include the following details where applicable:*

- *the names, addresses and telephone numbers of all emergency contact points relevant to the scope of supply, for fire, electricity, water and gas failures/leakage;*
- *full details of all hydrants, mains, fire appliances and access points shown on the site layout drawings as appropriate;*
- *all isolation points, e.g. electricity main supply switches, water stop cocks and main gas valves, clearly identified and their positions indicated on the site layout drawings;*
- *any specific hazard related to the scope of supply, its maintenance or operation; and*
- *emergency procedures and safety precautions.*